Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application. Please amend claims 57, 58, 64, 73, 74, 83, 84, 93 and 94 as follows:

Listing of Claims:

1-56. (Cancelled)

57. (Currently amended) A Doppler ultrasound system, comprising:

an ultrasound transducer from which ultrasound signals are emitted into the subject along an ultrasound beam axis;

an ultrasound receiver detecting echo signals resulting from the ultrasound signals emitted into the subject;

an analog-to-digital converter (ADC) circuit coupled to the ultrasound receiver to quantize the echo signals received by the ultrasound receiver into digital sample values; and

a processor coupled to the ADC circuit for processing the digital sample values to calculate blood flow data as a function of time for a plurality of locations along the ultrasound beam axis~~ and having a component associated with blood flow at each of the locations along the ultrasound beam axis for which blood flow data is calculated~~, the blood flow data representative of blood flow detected along the ultrasound beam axis as a function of time.

58. (Currently amended) The system of claim 57 wherein the processor comprises a processor <u>further operable to calculate</u> ~~calculating~~ detected Doppler signal power data as a function of time ~~for a plurality of locations along the ultrasound beam axis and the processor is further operable to generate data that varies the blood flow velocity component based on the detected Doppler signal power data~~ <u>and associate the detected Doppler signal power data to the blood flow data for the plurality of locations along the ultrasound beam axis</u>.

59. (Previously presented) The system of claim 57 wherein the processor comprises:

first processing circuitry for processing the digital sample values to calculate data representative of quadrature vectors, each quadrature vector having a first vector component and a second vector component;

digital filter circuitry coupled to the first processing circuitry for processing the data representative of the quadrature vectors to provide filtered quadrature vector data, the filtered quadrature vector data representative of the quadrature vectors having noise from outside a bandwidth of interest removed;

clutter removal circuitry coupled to the digital filter circuitry for processing the filtered quadrature vector data to provide clutter cancelled vector data, the clutter cancelled vector data representative of the filtered quadrature vector data having contribution from stationary reflectors removed; and

second processing circuitry coupled to the clutter removal circuitry for processing the clutter cancelled vector data to provide the blood flow velocity data as a function of time for the plurality of locations along the ultrasound beam axis.

60. (Previously presented) The system of claim 59 wherein the second processing circuitry coupled to the clutter removal circuitry further processes the clutter cancelled vector data to provide detected Doppler signal power data as a function of time for the plurality of locations along the ultrasound beam axis.

61. (Previously presented) The system of claim 59 wherein the first and second vector components comprises a real vector component and an imaginary vector component, respectively.

62. (Previously presented) The system of claim 57 wherein the blood flow data representative of blood flow detected along the ultrasound beam axis comprises first blood

flow velocity data representative of blood flow in a first direction, and second blood flow velocity data representative of blood flow in a second direction.

63. (Previously presented) The system of claim 57 wherein the processor coupled to the ADC is further operable to generate data indicating blood flow velocities as a function of time for a selected location along the ultrasound beam axis.

64. (Currently amended) A data processing engine for a Doppler ultrasound system having an ultrasound transducer from which ultrasound signals are emitted into the subject along an ultrasound beam axis and an ultrasound receiver detecting echo signals resulting from the ultrasound signals emitted into the subject, the data processing engine comprising:

an analog-to-digital converter (ADC) circuit coupled to the ultrasound receiver to quantize the echo signals received by the ultrasound receiver into digital sample values, the digital sample values stored as sample vectors; and

a processor coupled to the ADC circuit for processing the digital sample vectors to calculate blood flow data as a function of time for a plurality of locations along the ultrasound beam axis~~ and having a component associated with blood flow at each of the locations for which data is calculated~~, the processor further operable to process the sample vectors to calculate detected Doppler signal power data as a function of time ~~for a plurality of locations along the ultrasound beam axis and vary the component based on the detected Doppler signal power data~~ <u>and relate the Doppler signal power data to the blood flow data for the plurality of locations along the ultrasound beam axis</u>.

65. (Previously presented) The data processing engine of claim 64 wherein processing the digital sample vectors by the digital signal processor to calculate blood flow data comprises calculating a mean blood flow velocity for the plurality of locations along the ultrasound beam axis.

66. (Previously presented) The data processing engine of claim 64 wherein processing the digital sample vectors by the digital signal processor to calculate blood flow data comprises calculating a median blood flow velocity for the plurality of locations along the ultrasound beam axis.

67. (Previously presented) The data processing engine of claim 64 wherein processing the digital sample vectors by the digital signal processor to calculate blood flow data comprises calculating a peak blood flow velocity for the plurality of locations along the ultrasound beam axis.

68. (Previously presented) The data processing engine of claim 64 wherein the digital signal processor comprises:

first processing circuitry for processing the sample vectors to calculate data representative of quadrature vectors;

digital filter circuitry coupled to the first processing circuitry for processing the data representative of the quadrature vectors to provide filtered quadrature vector data, the filtered quadrature vector data representative of the quadrature vectors having noise from outside a bandwidth of interest removed;

clutter removal circuitry coupled to the digital filter circuitry for processing the filtered quadrature vector data to provide clutter cancelled vector data, the clutter cancelled vector data representative of the filtered quadrature vector data having contribution from stationary reflectors removed; and

second processing circuitry coupled to the clutter removal circuitry for processing the clutter cancelled vector data to provide the blood flow velocity data.

69. (Previously presented) The system of claim 68 wherein the second processing circuitry coupled to the clutter removal circuitry further processes the clutter cancelled vector data to provide detected Doppler signal power data as a function of time for the plurality of locations along the ultrasound beam axis.

70. (Previously presented) The data processing engine of claim 67 wherein the first processing circuitry comprises processing circuitry for calculating data representative of quadrature vectors, each quadrature vector having a first vector component and a second vector component.

71. (Previously presented) The data processing engine of claim 70 wherein the first and second vector components comprises a real vector component and an imaginary vector component.

72. (Previously presented) The data processing engine of claim 64 wherein the processor further generates spectrogram data indicating blood flow velocities as a function of time for a selected location along the ultrasound beam axis.

73. (Currently amended) In a Doppler ultrasound system emitting pulsed ultrasound signals along an ultrasound beam axis and detecting echo signals resulting therefrom, a method for generating blood flow information of a subject to which the Doppler ultrasound system is applied, the method comprising:

for each pulse of ultrasound, quantizing the detected echo signals to generate a plurality of digital sample values representative of the echo signals; and

processing digital sample values of the detected echo signals to calculate data representative of blood flow velocity detected along the ultrasound beam axis as a function of time ~~and having a component associated with blood flow velocity at each of the plurality of locations along the ultrasound beam axis~~.

74. (Currently amended) The method of claim 73, further comprising generating detected Doppler signal power data as a function of time ~~for a plurality of locations along the ultrasound beam axis and generating data that is representative of varying the component associated with blood flow velocity at each of the plurality of locations along the ultrasound beam axis based on the detected Doppler signal power data~~ and associating the

detected Doppler signal power data to the blood flow velocity for locations along the ultrasound beam axis.

75. (Previously presented) The method of claim 73, further comprising calculating filter coefficients based on the rate at which the detected echo signals are quantized and wherein processing the digital sample values comprises:

generating a quadrature vector from the plurality of digital sample values of each pulse of ultrasound;

processing each quadrature vector using the filter coefficients to calculate filtered quadrature vector data representative of the quadrature vector having noise from outside a bandwidth of interest removed; and

calculating from a plurality of quadrature vectors clutter cancelled vector data representative of the filtered quadrature vectors having contribution from stationary reflectors removed from the filtered quadrature vectors; and

processing the clutter cancelled vector data to provide the data representative of blood flow information.

76. (Previously presented) The method of claim 75, further comprising calculating detected Doppler signal power for the plurality of locations along an ultrasound beam axis from the clutter cancelled vector data .

77. (Previously presented) The method of claim 75 wherein quantizing comprises quantizing the detected echo signals at four times the frequency of the emitted ultrasound signals.

78. (Previously presented) The method of claim 77 wherein generating quadrature vectors from the plurality of digital sample values of each pulse of ultrasound comprises:

dividing the sample values into sets of four values, each set having first, second, third and fourth values; and

for each set, subtracting the third from the first values to generate a real vector component of the quadrature vector and subtracting the fourth from the second values to generate an imaginary vector component of the quadrature vector.

79. (Previously presented) The method of claim 73 wherein processing the digital sample values to calculate data representative of blood flow velocity further comprises calculating mean blood flow velocity data as a function of time for locations along the ultrasound beam axis.

80. (Previously presented) The method of claim 73 wherein processing the digital sample values to calculate data representative of blood flow velocity comprises calculating median blood flow velocity data as a function of time for locations along the ultrasound beam axis.

81. (Previously presented) The method of claim 73 wherein processing the digital sample values to calculate data representative of blood flow velocity comprises calculating peak blood flow velocity data as a function of time for locations along the ultrasound beam axis.

82. (Previously presented) The method of claim 73, further comprising generating data to representing spectral information indicating blood flow velocities at the selected one of the displayed locations.

83. (Currently amended) In a Doppler ultrasound system emitting ultrasound signals along an ultrasound beam axis and detecting echo signals resulting therefrom, a method for providing blood flow information of a subject to which the Doppler ultrasound system is applied, the method comprising:

quantizing the detected echo signals to generate a plurality of digital sample values representative of the echo signals;

generating quadrature vectors from the plurality of digital sample values;

processing the quadrature vectors to calculate blood flow data as a function of time for a plurality of locations along the ultrasound beam axis and to calculate detected Doppler signal power data as a function of time~~ for the plurality of locations along the ultrasound beam axis~~; and

generating data from the blood flow data and the detected Doppler signal power data that is representative of blood flow detected along the ultrasound beam axis as a function of time, the data representing the Doppler signal power associated to the blood flow data for ~~having a component associated with blood flow at~~ each of the locations ~~that varies based on the corresponding detected Doppler signal power data~~ along the ultrasound beam axis.

84. (Currently amended) The method of claim 83, further comprising processing the quadrature vectors to calculate detected Doppler signal power data as a function of time for the plurality of locations along the ultrasound beam axis~~, and generating data from the detected Doppler signal power data representative of varying the blood flow velocity component based on the detected Doppler signal power data~~ at which the blood flow data is calculated.

85. (Previously presented) The method of claim 83 wherein quantizing comprises quantizing the detected echo signals at four times the frequency of the emitted ultrasound signals.

86. (Previously presented) The method of claim 85 wherein generating quadrature vectors from the plurality of digital sample values comprises:

dividing the sample values into sets of four values, each set having first, second, third and fourth values; and

for each set, subtracting the third from the first values to generate a real vector component of the quadrature vector and subtracting the fourth from the second values to generate an imaginary vector component of the quadrature vector.

87. (Previously presented) The method of claim 83, further comprising calculating filter coefficients based on the rate at which the detected echo signals are quantized, and wherein processing the quadrature vectors to calculate blood flow data comprises:

processing each quadrature vector using the filter coefficients to calculate filtered quadrature vector data representative of the quadrature vector having noise from outside a bandwidth of interest removed;

calculating from the data for a plurality of quadrature vectors clutter cancelled vector data representative of the filtered quadrature vectors having contribution from stationary reflectors removed from the filtered quadrature vectors; and

processing the clutter cancelled vector data to provide blood flow velocity data as a function of time for the plurality of locations along the ultrasound beam axis.

88. (Previously presented) The method of claim 87, further comprising calculating detected Doppler signal power for each of the first plurality of locations along an ultrasound beam axis from the clutter cancelled vector data.

89. (Previously presented) The method of claim 83, further comprising processing the quadrature vectors to calculate a mean velocity for each of the plurality of locations along the ultrasound beam axis.

90. (Previously presented) The method of claim 83, further comprising processing the quadrature vectors to calculate a median velocity for each of the plurality of locations along the ultrasound beam axis.

91. (Previously presented) The method of claim 83, further comprising processing the quadrature vectors to calculate a peak velocity for each of the plurality of locations along the ultrasound beam axis.

92. (Previously presented) The method of claim 83, further comprising generating data representing spectral information indicating blood flow velocities at the selected one of the displayed locations.

93. (Currently amended) A computer-readable medium having computer executable instructions for controlling digital processing circuitry in a Doppler ultrasound system to process detected ultrasound echo signals and provide blood flow information, by:

controlling an analog-to-digital converter (ADC) circuit to quantize the detected ultrasound echo signals to generate a plurality of digital sample values representative of the ultrasound echo signal;

generating quadrature vectors from the plurality of digital sample values;

processing the quadrature vectors to calculate blood flow data as a function of time for a plurality of locations along the ultrasound beam axis and to calculate detected Doppler signal power data as a function of time~~ for the plurality of locations along the ultrasound beam axis~~; and

processing the blood flow data <u>and the detected Doppler signal power data</u> to <u>relate the Doppler signal power data to the blood flow data</u> ~~generate data that is representative of blood flow as a function of time detected~~ for the plurality of locations along the ultrasound beam axis~~, the blood flow data having a component at each of the plurality of locations that varies based on the corresponding detected Doppler signal power data~~.

94. (Currently amended) The computer readable medium of claim 93 wherein the computer executable instructions for processing the blood flow data comprises processing the quadrature vectors to calculate detected Doppler signal power data for the plurality of locations along the ultrasound beam axis ~~and processing the blood flow data to generate data representing varying the component based on the detected Doppler signal power data~~ at which the blood flow data is calculated.

95. (Previously presented) The computer readable medium of claim 93 wherein the computer executable instructions for controlling the ADC circuit comprises computer executable instructions for controlling the ADC circuit to quantize the detected echo signals at four times the frequency of the emitted ultrasound signals.

96. (Previously presented) The computer readable medium of claim 95 wherein the computer executable instructions for generating quadrature vectors from the plurality of digital sample values comprises computer executable instructions for:

dividing the sample values into sets of four values, each set having first, second, third and fourth values; and

for each set, subtracting the third from the first values to generate a real vector component of the quadrature vector and subtracting the fourth from the second values to generate an imaginary vector component of the quadrature vector.

97. (Previously presented) The computer readable medium of claim 93, further comprising computer executable instructions for calculating filter coefficients based on the rate at which the detected echo signals are quantized, and wherein the computer executable instructions for processing the quadrature vectors to calculate blood flow data comprises computer executable instructions for:

processing the quadrature vectors using the filter coefficients to calculate filtered quadrature vector data representative of the quadrature vectors having noise from outside a bandwidth of interest removed; and

calculating clutter cancelled vector data representative of the filtered quadrature vector data having contribution from stationary reflectors removed from the filtered quadrature vector data.

98. (Previously presented) The computer readable medium of claim 97, further comprising computer executable instructions for calculating the detected Doppler signal power as a function of time for the plurality of locations along an ultrasound beam axis from the clutter cancelled vector data.

99. (Previously presented) The computer readable medium of claim 93, further comprising computer executable instructions for processing the quadrature vectors to calculate a mean velocity for the plurality of locations along the ultrasound beam axis.

100. (Previously presented) The computer readable medium of claim 93, further comprising computer executable instructions for processing the quadrature vectors to calculate a median velocity for the plurality of locations along the ultrasound beam axis.

101. (Previously presented) The computer readable medium of claim 93, further comprising computer executable instructions for processing the quadrature vectors to calculate a peak velocity for the plurality of locations along the ultrasound beam axis.

102. (Previously presented) The computer readable medium of claim 93, further comprising computer executable instructions for processing the blood flow data to display spectral information indicating blood flow velocities at the selected one of the locations along the ultrasound beam axis.

103. (Previously presented) The computer readable medium of claim 93 wherein the computer executable instructions for processing the blood flow data to generate data that is representative of blood flow as a function of time detected for the plurality of locations

along the ultrasound beam axis comprises computer executable instructions for processing the blood flow data to generate data representative of blood flow in a first direction and generate data representative of blood flow in a second direction.